Image Retouching Techniques

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Introduction

Picture Window has many useful tools for freehand retouching of photographic images, but learning to use them skillfully can take some practice. Once you master the techniques described below, you should be able to quickly and easily handle minor tasks like removing dust specks, eliminating red eye, repairing minor damage from scratches or tears, or removing facial blemishes. With a little practice you will be ready to tackle more demanding jobs like removing power lines from and image or even restoring or colorizing old photographs.

General Tips and Recommendations

Zoom in on the image

It is almost always easier to retouch an image if you first zoom in on the area you will be reworking to at least 1:1 and preferably 2:1 or higher. There are several reasons for this:

- At zoom factors less than 1:1, only some of the pixels in the original image are displayed so you can easily miss small specks or other defects entirely. When retouching an image in preparation for printing, for example, it is a good idea to make a systematic scan scrolling over the entire image at 1:1 or 2:1 to check for dust specks, hairs, scratches, or other minor defects you may want to remove.

- When you perform the actual retouching operations, the higher the magnification, the less you have to be concerned about small movements of the mouse producing an unintended effect and consequently the easier it is to control the retouching tools. Also zooming in makes it easier to see the area of interest and the effect you are having.

On the other hand, if you are performing gross retouching operations like erasing a large background area zooming in may be counterproductive. With a little experience, you will soon have a feel for the best magnification ratio for each situation.

Short strokes make undo more useful

Most of the retouching tools operate in strokes. A single stroke is laid down between the time you click the left mouse button over the image until you release the mouse button. The undo feature works one stroke at a time, so if you make all your changes in one long stroke, you cannot undo just one part of your work -- it's all or nothing. If you work in short strokes and your hand slips or you make a mistake, you can undo it quickly and continue. Note that you must set Undo to Multilevel in the File Preferences dialog box to enable this feature.

Another reason to use short strokes when working with the Clone tool is that, when the area being cloned *from* overlaps the area being cloned *to*, Picture Window performs additional processing to avoid recycling the same image data over and over and creating a sort of washboard effect. This processing involves searching the undo buffer for the current stroke and consequently takes more and more time as the stroke gets longer. This in turn can make the clone tool unresponsive, so it is especially important to use short strokes in this case.

Use the Ctrl-Z keyboard shortcut for Undo

Many people find it easier to use the keyboard shortcut for Undo (Control-Z) instead of moving the mouse up to the menu and selecting the Undo command. This key combination is easy to type using your left hand only and leaves the cursor positioned over the image ready to redo the last operation.

Work slowly for more realistic effects

In most cases, better results are obtained by building up the effect you want a little at a time. This helps obscure the individual retouching strokes, blends in the retouched areas smoothly with the rest of the image, and lets you pause to evaluate your work as it progresses. For most tools, the Transparency slider controls how much of an effect the tool has on the image -- the greater the transparency, the more subtle the effect.

Using masks to protect a region from retouching

Occasionally you may wish to retouch one part of an image while leaving an adjacent region untouched. Rather than depend on your manual dexterity and carefully work around the area you want to leave unchanged, it is often easier to create a mask for the region you want to protect. While a mask is in place over the image, the retouching tools will leave the masked region unmodified and only changed the unmasked part of the image. You can set the mask tool to display the masked part of the image with an opaque or semitransparent color overlay or you can hide the mask overlay for an unobstructed view of the image. This technique lets you work quickly and freely without fear of changing the masked part of the image.

Avoid overworking an area

Retouching can improve an image dramatically, but overworking an area can make its texture unnatural and lose the freshness of the original image. Try to be efficient and economical in your retouching and the results will likely improve.

Switching between tools

At any one time at most one tool is active. If you have several tool dialog boxes open on the screen, you can switch between tools by simply clicking on the dialog box window for the tool you want to activate. Or, you can click the corresponding icon on the tool bar.

Cloning techniques

Picture Window's cloning tool is one of its most powerful retouching features. Unlike many other operations you can perform using your computer, cloning has no direct equivalent in conventional darkroom work. Cloning is a little like painting

over part of a photograph, but instead of using a solid color you paint one part of an image over another part of the same or a different image. Because you are copying existing image data rather than creating new data, the cloning tool can create many realistic effects with much less effort than painting. By carefully selecting the part of the image you are painting with, you can get an accurate color match and texture match with the surrounding area.

Basic cloning technique

Cloning works by copy small circular patches of data from one image to another.

The first step in cloning is to activate the cloning tool by clicking on the ✎ icon on the Picture Window tool bar. This brings up the Clone dialog box; whenever this dialog box is the topmost window, the cloning tool is active. Here's how to use the cloning tool:

1. **Set the reference point.** The reference point is the place from which image data will be copied when you start cloning. To set the reference point, hold down either Shift key on the keyboard with one hand, position the mouse cursor to the desired reference point, and click the left mouse button once. A small circle will then appear at the selected reference point. To move the reference point, just Shift-click again at the desired location -- you can reposition the reference point at any time.

   The radius of the circle corresponds to the Radius setting in the Clone dialog box -- this setting controls the size of the image patches that will be painted over the target image when you start cloning. Adjust the Radius slider in the Clone dialog box to make the size of the circle the size you want to work at. If the Clone dialog box has become covered by other windows you can always bring it back to the top by clicking on the ✎ icon on the tool bar. The smaller the radius, the more control you have and the tighter the area you can retouch without affecting the surrounding region. The larger the circle, the smoother the effect and the more quickly you can cover a large area.

   You can adjust the Transparency and Softness sliders as well although the default settings work well most of the time. The higher the transparency setting, the more of the unretouched image will show through as you clone. This lets you retouch by gradually covering the target region in multiple passes. A lower transparency setting will have greater covering power, but the effect will be a little more obvious. Similarly, the Softness setting controls how smoothly the

edges of each patch are blended into the target area. A high softness setting gives more blending while a low softness setting gives the cloning brush a hard edge.

2. **Go to the target point.** The target point is the part of an image you want to retouch -- this can be part of the same image or part of a different image. To select a different image, either click on its title bar or use the ⬚ icon on the Picture Window tool bar to bring it to the top. To prepare to clone, position the mouse cursor to the exact spot you want the image data enclosed in the circle around the reference point to be copied to.

3. **Clone.** To start cloning, depress the left mouse button and hold it down as you move the cursor over the target area -- this changes the cursor to a crosshair and starts cloning. As you move the crosshair over the target area, patches of image data around the reference point are copied to the target point crosshair. The two points remain locked together so that as you move the target point over the image, the reference point moves at the same time. This lets you can copy irregular areas by moving the target point over the area to be retouched. When you are done, release the mouse button and the stroke will end at that point.

The following sequence of images illustrates removing a traffic sign by cloning foliage over it. The first image shows the original image after setting the reference point and adjusting the radius slider. The second image shows the screen just after clicking the mouse button -- the cursor has been redrawn as a crosshair and a small bite has been taken out of the sign by copying a patch of foliage from the reference circle. The next image shows the screen after moving the crosshair back and forth over the top part of the sign while holding down the mouse button. The last image shows the final result after passing the crosshair over the entire sign, releasing the mouse button, and terminating the clone tool.

Set Reference Point   Start Cloning   Halfway done   Final Result

This example illustrates removing the entire sign using a single stroke. This works fairly well for this example, but if you look carefully you can see parts of the foliage that are repeated. A more realistic effect can be obtained by cloning in several strokes, each taken from a different reference point. This tends to break up any regular patterns the eye can pick up.

Just as cloning can be used to remove objects from an image by replacing them with background, it can also be used to place objects in an image by copying them over the background. For example, you can use cloning to copy an object from one place in an image to another or from one image to another.

Cloning near edges

Special care is required when retouching an image near a prominent edge between two objects. The goal is to repair a defect like a scratch that passes across an edge while keeping the edge smooth. If this is not done properly, a jagged or interrupted edge will result which can stick out like a sore thumb. For example, in the images below a scratch that crosses the edges between the background and the eyebrow, the eyebrow and the forehead, and the forehead and the hair line has been removed.

Image with scratch crossing face   Retouched image with scratches removed

The technique for removing this kind of scratch is fairly simple. First you must set a reference point right on the edge you want to retouch, but displaced a short distance from the spot that needs to be repaired. Then move the cursor to a point right on the edge in the center of the defect and start cloning in both directions along the scratch. Because of the way the initial reference and target points are positioned, you are guaranteed that an intact section of the edge will precisely replace the damaged section.

The images below illustrate where to set the initial reference and target points and show the result of moving the target point up across the eyebrow into the forehead area. To retouch the part of the scratch that covers the background, simply return the target point to its initial location and clone in the other direction along the scratch. To repair the area near the hair line, reposition the reference point a little to the left of where the scratch crosses the hair line and the target point right where the scratch crosses the hair line and then once again clone along the scratch in both directions.

Cloning across the gradient

Even where a scratch does not cross an obvious edge but just crosses an area which gradually changes from one color to another, you must be careful how you position the target point with respect to the reference point. For a seamless match, the cloning patches around the reference point to be the same color and texture as the patches at the target point. To accomplish this, you need to select a reference point that is offset slightly from the target point in a direction perpendicular to the direction of the gradient. For example, if you are retouching over an area that changes from light to dark as you move left to right, you should position the reference point either above or below the target point. With a little practice, you can see and follow the natural contours of the image and your retouching efforts will improve.

Using the cloning options

Clicking the **OPT** ↓ button in the Clone dialog box brings up an options menu you can use to alter the way the cloning tools works. Cloning options fall into several groups:

copy/lighten only/darken only:

The default setting is **copy**. If you select **lighten only** (or **darken only**), then during the cloning operation, just before a pixel in the target image is about to be replaced, the brightness of the new value is compared to the old value and the cloning operation only goes ahead if the new pixel is lighter than (or darker than) the original.

This is useful for retouching a light defect on a dark background (use darken only) or a dark defect on a light background (use lighten only). Using these option restricts the operation of the clone tool to just those areas that need to be changed and leaves the parts that were OK untouched.

linked/free/one-to-one/fixed:

The default setting is **linked**. This option controls what happens to the reference point when you move the cursor.

linked: the reference point and the target point remain linked at a fixed offset from each other, whether the mouse button is up or down. This guarantees that you can clone a large area using a number of short strokes without having to worry about misalignment between them.

free: the reference point snaps back to its initial location as soon as you release the mouse button at the end of a stroke. This can be useful if you want to use the clone tool to paint multiple copies of the same object over the target image.

one-to-one: the reference point and the target point remain permanently locked at the same location in the reference and target images. This option is only useful when cloning from one version of an image to another version of the same image. Say for example that you want to lighten part of an image. You could use the lighten tool, but this is tricky because its effect is cumulative and you must apply it very evenly to get a consistent result. On the other hand, you can use one of Picture Windows Gray transformations such as Brightness, Brightness Curve, or Levels to create a lightened version of the entire image and then use one-to-one cloning to paint the lighter version over the original is just those areas you want to brighten up. The advantage of this technique is that no matter how much you clone over a given area, it will never get any lighter than the reference image.

fixed: the reference point never moves. This is a little like painting with a solid color brush but you are painting with a fixed circle taken from of the reference image.

continuous/single:

The default setting is **continuous**. If you select **single**, then the cloning tool is applied just once when you first click the left mouse button -- after the first application the tool goes dead, no matter how you move the crosshair with the left mouse button depressed. This option can be useful when you want to clone very carefully with the minimum possible effect each time you click the mouse button.
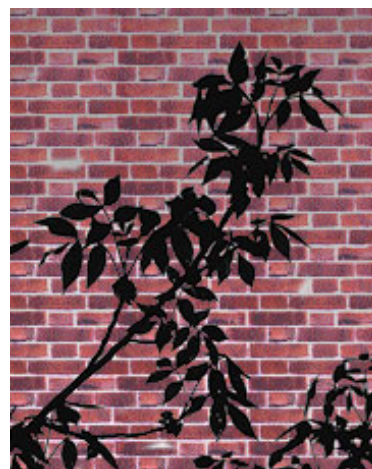
tiled:

This option controls what happens when you move the target point so far that the reference point hits the edge of the reference image. Normally, cloning stops at this point as there is no image data past the edge to copy. If you select the tiled option however, the reference point jumps to the opposite side of the reference image and continues on from there. This is useful where you have a reference image that has been constructed as a repeating tile so that opposite edges mesh seamlessly. Using the tiled option, you can then paint the image over as large a target area as you want and it will automatically repeat as necessary. This option can be combined with other options as illustrated below for interesting effects.
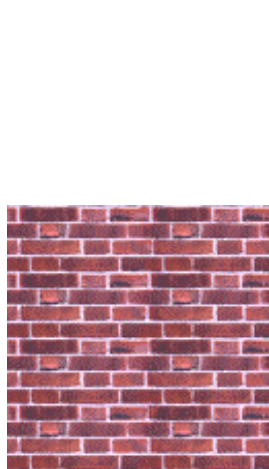
reference image tile   target image before cloning   target image after cloning with **tiled** and **lighten only** options

Seamless tiles can be created using the Texture transformation or you can purchase sets of images on CD-ROM made to be used as tiles.

Cloning one-to-one

This option, available from the option menu, is very useful for cloning from one version of an image to another version of the same image, since it forces the reference point to be permanently locked to the cursor location. This technique is only useful when you are working with two different images which line up with each other perfectly. One-to-one cloning lets you paint part of one version of the image over the other without worrying about any possible misalignment between the two images. As with the other cloning options, you can adjust the radius, softness, and transparency to control the effect.

For example, suppose you want to lighten parts of an image. One way to do this is to start by using the Brightness, Levels, or Brightness Curve transformation to create a lighter version of the entire image. Then use one-to-one cloning to paint the lighter version over the original just in those areas you want to lighten up. The advantage of this technique over using the lighten tool is that its effect is limited -- you can never accidentally lighten the image more than the lighter version of the image.

Naturally, you can use one-to-one cloning with any other transformation as well. In fact, you can turn any transformation into a freehand brush -- just apply the transformation to an image and clone the result back one-to-one over the input image wherever you want.

Tips for performing specific jobs

The following sections contain useful tips and suggestions for using Picture Window to perform a variety of common retouching tasks.

Removing specks, facial blemishes, and other small defects

Removing dust specks or other minor, localized imperfections is usually best done using Picture Window's speck removal or cloning tools.

The speck removal tool and when to use it

The speck removal tool is like a smart eraser that can eradicate a tiny patch of an image by borrowing pixels from the defect's immediate neighborhood. This technique works best for removing very small image defects like dust specks, freckles, and pinholes, especially when they are located against a relatively smooth background such as a clear blue sky. Fortunately, this is not only where specks stand out the most but also where they are easiest to repair. If the speck happens to sit right on the edge of an object or on a very irregular background cloning may work better (see below).

Activating and configuring the speck removal tool

To activate the speck removal tool, click on the Miscellaneous tools icon on the tool bar and then select Speck Removal from the Tool control. You can use the Radius, Transparency, and Softness sliders to control the effect of the tool. The most important of these is the Radius slider as it defines the size of the region that will be affected. If you select a transparency value of zero, the speck removal tool will totally replace the speck with the background; the larger the transparency value, the more subtle the effect of the tool. Similarly, the softness slider controls how smoothly the edge of the patch is blended into the original image. In most cases the speck removal tool works best with a low transparency setting and a moderate softness setting.

Using the speck removal tool

To use the speck removal tool, position the cursor over the speck, adjust the radius if necessary so that the speck is just barely covered by the circle. If the radius is too large, the effect of the tool may appear artificial; if the radius is too small, you may not be able to remove the entire speck. Once you have set the radius, just click the left mouse button once with the circle positioned over the speck.

You can also use the Speck Removal tool by clicking and dragging the cursor to retouch oblong defects, hairs, or scratches.

Removing scratches, telephone wires, etc.

Removing scratches is a little trickier than removing isolated defects. The most effective technique is usually to select the cloning tool and then shift-click on a spot very near the scratch, but displaced slightly to one side or the other. Then carefully paint along the scratch. Sometimes clicking and dragging the speck removal tool along the scratch does a good job of removing it.

Removing entire objects

To remove an object, you must recreate the background that it obscures. This can either be very easy or nearly impossible, depending on the image. Foliage and other backgrounds with a random texture or smooth backgrounds like sky are relatively easy to clone from adjacent areas. To avoid obvious repetitions of background elements, use a relatively short strokes and work from a number of different reference points when filling in a large area.